IN THE CLAIMS:

Please write the claims to read as follows:

Please cancel claims 1-3, 9, 11-12, 15-18, 20-21, 23, 26-27, 29-32, 45, 58, 66, 70-71, 90-97, 101, 105, and 110 without prejudice.

1   1-43. (Cancelled).

1   44. (Currently Amended) A routing system for distributing packets in a network,

2   wherein the packets originate at a source and are returned to a destination, both source

3   and destination external with respect to the routing system, comprising:

4   a plurality of network interfaces that transfer packets to a destination and from a

5   source;

6   a plurality of route processing engines;

7   a hash mechanism that performs a hashing function on at least a portion of net-

8   work layer information packet, in the packets transferred to the routing system, to deter-

9   mine a distribution of the packets to the route processing engines for processing by the

10   engines, and;

11   a processing mechanism that determines packets belonging to a same flow and

12   their original order from the network layer information of the packets, the network layer

13   information including at least the same source/destination and protocol; and

14   a data transferer that sends each ordered packet flow to a single route processing

15   engine, thereby preserving the original ordered packet flows.

1   45. (Cancelled).

1   46. (Currently Amended) The router as in claim <u>52, or claim 55,</u>45 further comprising:

2   said data compiler selection of said processing engine is partly table driven.

1   47. (Cancelled)

1   48. (Currently Amended) The router as in claim <u>52, or claim 55,</u>45 further comprising:

2   said data compiler distributes the packets among said plurality of processing en-

3   gines.

1   49. (Currently Amended) The router as in claim <u>52, or claim 55, or claim 61,</u>45 further

2   comprising:

3   said hash function uses a destination address information.

1   50. (Currently Amended) The router as in claim <u>52, or claim 55, or claim 61,</u>45 further

2   comprising:

3   said hash function uses a protocol information.

1   51. (Currently Amended) The router as in claim <u>52, or claim 55, or claim 61,</u>45 further

2   comprising:

3   said hash function uses a source port information.

1   52. (Currently Amended) A router, comprising:

2   a plurality of processing engines for processing packets;

3   an interface for receiving a received packet from a network;

4   a data compiler to perform a hash function on said received packet to generate a
5 hash result, and to select a selected processing engine from said plurality of processing
6 engines in response to said hash result; and,

7   a switch to distribute said packet to said selected processing engine; and

8   said data compiler determines an IP source address having source bytes and an IP
9 destination address having destination bytes and a protocol byte, and performs said hash
10 function by performing an exclusive OR (XOR) to said source bytes and said destination
11 bytes and said protocol byte to generate said hash result as at least one output byte, said at
12 least one output byte to designate a flow to which said received packet belongs, and
13 routing all packets having the same flow to a selected processing engine.

1 53. (Currently Amended) ~~A router, comprising:~~The router as in claim 52, or claim 55,
2 further comprising:
3   ~~a plurality of processing engines for processing packets;~~
4   ~~an interface for receiving a received packet from a network;~~
5   ~~a data compiler to perform a hash function on said received packet to generate a~~
6 ~~hash result, and to select a selected processing engine from said plurality of processing~~
7 ~~engines in response to said hash result;~~
8   ~~a switch to distribute said packet to said selected processing engine; and~~
9   said data compiler puts packets received from said network into packet digest
10 form before transferring them to said switch.

1 54. (Currently Amended) The router as in claim <u>52, or claim 55,</u>~~45,~~ further comprising:

4

2   said switch receiving said packet after said processing engine finishes processing

3   said packet~~,~~; and then

4   ~~and then~~ said switch routing said packet to an interface to transmit said packet out

5   to said network.

1   55. (Previously Presented) A router, comprising:

2   a plurality of processing engines located within said router for processing packets;

3   an interface for receiving a received packet from a network;

4   a data compiler to perform a hash function on a destination address of said re-

5   ceived packet to generate a hash result, and to select a selected processing engine from

6   said plurality of processing engines located within said router in response to said hash

7   result;

8   a switch to distribute said packet to said selected processing engine; and

9   each processing engine of said plurality of processing engines having a plurality

10   of queues, said packet has classification information in a header, and said processing en-

11   gine selects a queue of said plurality of queues in response to said classification informa-

12   tion.

1   56. (Previously Presented) The router as in claim 55, further comprising:

2   said classification information indicates a priority of said packet.

1   57. (Currently Amended) The router as in claim <u>52, or claim 55,</u>~~45,~~ further comprising:

2   said processing engine performs routing of said packet.

1   58. (Cancelled).

1   59. (Currently Amended) The router as in claim 52, or claim 55,45, further comprising:

2   said processing engine performs filtering on said packet.

1   60. (Currently Amended) The router as in claim 52, or claim 55,45, further comprising:

2   said data compiler allocating said processing of packets to remaining processing

3   engines in the event that a processor fails.

1   61. (Previously Presented) A router, comprising:

2   a plurality of processing engines for processing packets;

3   an interface for receiving a received packet from a network;

4   a data compiler to perform a hash function on said received packet to generate a

5   hash result, and to select a selected processing engine from said plurality of processing

6   engines in response to said hash result;

7   a switch to distribute said packet to said selected processing engine;

8   said data compiler detecting that a particular packet requires specialized process-

9   ing; and

10   said switch distributing said particular packet to a specialized processing engine

11   to perform said specialized processing.

1   62. (Previously Presented) The router as in claim 61, further comprising:

2   said specialized processing is compression.

63. (Previously Presented) The router as in claim 61, further comprising:

    said specialized processing is decompression.

64. (Previously Presented) The router as in claim 61, further comprising:

    said specialized processing is encryption.

65. (Previously Presented) The router as in claim 61, further comprising:

    said specialized processing is routing.

66. (Cancelled).

67. (Currently Amended) The router as in claim 52, or claim 55,45, further comprising:

    said processing engine performs encryption on said packet.

68. (Currently Amended) The router as in claim 52, or claim 55,45, further comprising:

    said processing engine performs decryption on said packet.

69. (Currently Amended) The router as in claim 52, or claim 55, or claim 61,45, further comprising:

    said switch is a crossbar switch.

70-71. (Cancelled).

1 72. (Currently Amended) The method as in claim 78, or claim 79,71, further compris-

2 ing:

3   selecting a processing engine by using said hash result and a table.

1 73. (Currently Amended) The method as in claim 78, or claim 79,71, further comprising:

2   distributing the packets among said plurality of processing engines.

1 74. (Currently Amended) The method as in claim 78, or claim 79, or claim 80, or claim

2 85,71 further comprising:

3   using a source address information in said hash function calculation.

1 75. (Currently Amended) The method as in claim 78, or claim 79, or claim 80, or claim

2 85,71 further comprising:

3   using a destination address information in said hash function calculation.

1 76. (Currently Amended) The method as in claim 78, or claim 79, or claim 80, or claim

2 85,71 further comprising:

3   using a protocol information in said hash function calculation.

1 77. (Currently Amended) The method as in claim 78, or claim 79, or claim 80, or claim

2 85,71 further comprising:

3   using a source port information in said hash function calculation.

1 78. (Previously Presented) A method of processing packets in a router, comprising:

2   receiving a packet from a network;

3   performing a hash function calculation on said packet to produce a hash result;

4   switching, in response to said hash result, said packet to a processing engine of a

5   plurality of processing engines in said router, for further processing of said packet; and

6   performing an exclusive OR (XOR) in response to a source address and a desti-

7   nation address and a protocol byte to generate said hash result as at least one output byte,

8   said at least one output byte to designate a flow to which said received packet belongs,

9   and routing all packets having the same flow to a selected processing engine.

1   79. (Previously Presented) A method of processing packets in a router, comprising:

2   receiving a packet from a network;

3   performing a hash function calculation on a destination address of said packet to

4   produce a hash result;

5   switching, in response to said hash result, said packet to a processing engine of a

6   plurality of processing engines in said router, for further processing of said packet; and

7   allocating said packets to remaining processing engines in the event that a proc-

8   essing engine fails.

1   80. (Previously Presented) A method of processing packets in a router, comprising:

2   receiving a packet from a network;

3   performing a hash function calculation on said packet to produce a hash result;

4   switching, in response to said hash result, said packet to a processing engine of a

5   plurality of processing engines in said router, for further processing of said packet;

6   detecting that a particular packet requires specialized processing; and

9

7   distributing said particular packet to a specialized processing engine to perform

8   said specialized processing.

1   81. (Currently Amended) The method as in claim 80, further comprising:

2   processing compression as said specialized processing.

1   82. (Previously Presented) The method as in claim 80, further comprising:

2   processing decompression as said specialized processing.

1   83. (Previously Presented) The method as in claim 80, further comprising:

2   processing encryption as said specialized processing.

1   84. (Previously Presented) The method as in claim 80, further comprising:

2   processing routing as said specialized processing.

1   85. (Currently Amended) A router, comprising:

2   a plurality of processing engines located within said router for processing packets;

3   an interface for receiving a packet from a network, said packet referred to as a re-

4   ceived packet;

5   a hashing function to perform a hash calculation on a destination address of said

6   packet, said hash calculation producing a hash result;

7   a data compiler to determine a type of service required by said received packet;

8   and;

9   a switch, responsive to said type of service and responsive to said hash result, to

10   distribute said packet to a selected processing engine of said plurality of processing en-

11   gines located within said router, said selected processing engine providing said type of

12   service.

1   86. (Currently Amended) The ~~apparatus~~ router as in claim 85, further comprising:

2   said type of service is compression.

1   87. (Currently Amended) The ~~apparatus~~ router as in claim 85, further comprising:

2   said type of service is decompression.

1   88. (Previously Presented) The router as in claim 85, further comprising:

2   said type of service is encryption.

1   89. (Previously Presented) The router as in claim 85, further comprising:

2   said type of service is routing.

1   90-97. (Cancelled)

1   98. (Previously Presented) A router for distributing packets in a network, the packets

2   originate at a source and are routed to a destination, comprising:

3   a plurality of route processing engines located within said router;

4   a mechanism that performs a hashing function on at least a portion of network

5   layer information in said packets, said information indicating said destination, said hash-

6   ing function producing an indicia of a flow;

7   a classification engine to switch packets with a same said indicia of a flow to a

8   single route processing engine of said plurality of route processing engines; and

9   said packets are a plurality of packets, individual packets of said plurality of

10   packets arrive in substantially random order to produce different values of said informa-

11   tion in random order, and said classification engine carries out a hashing function to pro-

12   duce said indicia of flow, and different values of said indicia of flow are in substantially

13   random order in response to said plurality of packets arriving in random order, and a par-

14   ticular flow always produces a same indicia of flow, and said particular flow is assigned

15   to a particular route processing engine in the order that a first packet of said particular

16   flow first arrives at said router.

1   99. (Currently Amended) The ~~apparatus~~ router of claim 98, further comprising:

2   said random order of arrival of said first packet of said particular flow leads to a

3   distribution of packets being assigned to said route processing engines.

1   100. (Currently Amended) The router of claim 98,~~97~~, further comprising:

2   said information indicating said destination includes a destination address of said

3   destination.

1   101. (Cancelled).

1   102. (Currently Amended) A method of operating a router, comprising:

2   receiving a packet by said router, said packet addressed to a destination, said

3   router having a plurality of route processing engines;

4   hashing a portion of a network layer information of said packet, said information

5   indicating said destination, to determine an indication of a flow~;

6   selecting, in response to said indication of a flow, one processing engine of said

7   plurality of processing engines to process the flow indicated;

8   said receiving step receives a plurality of packets, individual packets of said plu-

9   rality of packets arrive in substantially random order to produce different values of said

10   information in random order;

11   said hashing step produces different values of said indication of a flow in sub-

12   stantially random order in response to said plurality of packets arriving in random order;

13   producing by a particular flow a same indicia of flow; and

14   assigning said particular flow to a particular route processing engine in the order

15   that a first packet of said particular flow first arrives at said router.

1   103. (Currently Amended) The method of claim 102, further comprising:

2   assigning, in response to said random order of arrival of said first packet of said

3   particular flow, a distribution of packets to said route processing engines.

1   104. (Currently Amended) The method of claim 102,~101~, further comprising:

2   including in said information a destination address of said destination.

1   105. (Cancelled).

1   106. (Currently Amended) A router, comprising:

2   a port adapter to receive a packet by said router, said packet addressed to a desti-

3   nation, said router having a plurality of route processing engines;

4   means for hashing a portion of a network layer information of said packet, said in-

5   formation indicating said destination, to determine an indication of a flow:;

6   means for selecting, in response to said indication of a flow, one processing en-

7   gine of said plurality of processing engines to process the flow indicated;

8   means for receiving a plurality of packets, individual packets of said plurality of

9   packets arrive in substantially random order to produce different values of said informa-

10   tion in random order;

11   means for producing different values of said indication of a flow in substantially

12   random order in response to said plurality of packets arriving in random order;

13   means for producing by a particular flow a same indicia of flow; and

14   means for assigning said particular flow to a particular route processing engine in

15   the order that a first packet of said particular flow first arrives at said router.

1   107. (Currently Amended) The apparatus-router of claim 106, further comprising:

2   means for assigning, in response to said random order of arrival of said first

3   packet of said particular flow, a distribution of packets to said route processing engines.

1   108. (Currently Amended) The apparatus-router of claim 106,105, further comprising:

2   said information includes a destination address of said destination.

1   109. (Currently Amended) A computer readable media, comprising:

2   said computer readable media having instructions written thereon for execution on

3   a processor for the practice of the method of ~~claim 101~~.,

4   receiving a packet by said router, said packet addressed to a destination, said

5   router having a plurality of route processing engines;

6   hashing a portion of a network layer information of said packet, said information

7   indicating said destination, to determine an indication of a flow;

8   selecting, in response to said indication of a flow, one processing engine of said

9   plurality of processing engines to process the flow indicated;

10   said receiving step receives a plurality of packets, individual packets of said plu-

11   rality of packets arrive in substantially random order to produce different values of said

12   information in random order;

13   said hashing step produces different values of said indication of a flow in sub-

14   stantially random order in response to said plurality of packets arriving in random order;

15   producing by a particular flow a same indicia of flow; and

16   assigning said particular flow to a particular route processing engine in the order

17   that a first packet of said particular flow first arrives at said router.

1   110. (Cancelled).